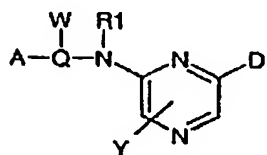


58.

CLAIMS

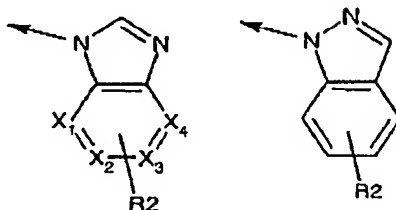
1. A compound of the general formula (I)



I

or pharmaceutically acceptable prodrugs, salts, hydrates, solvates, crystal forms or diastereoisomers thereof, wherein:

D is a heterocyclic ring selected from:



where X_1, X_2, X_3, X_4 are optionally substituted carbon, or one of X_1, X_2, X_3, X_4 is nitrogen and the rest optionally substituted carbon;

R_2 is 0-3 substituents independently chosen from H, halogen, C_{1-4} alkyl, CF_3 , OCF_3 , $OCHF_2$, CN, aryl, hetaryl, C_{1-4} alkylOH, C_{1-4} alkylNR $_{3R4}$, C_{1-4} alkylhetaryl, OC_{1-4} alkyl, OC_{1-4} alkylNR $_{3R4}$, OC_{1-4} alkylhetaryl, OC_{1-4} alkylOH, CO_2R_3 , CONR $_{3R4}$, NR $_{3R4}$, nitro, NR $_{3R4}COR_4$, NR $_{5CONR3R4}$, NR $_{3SO_2R4}$, C_{1-4} alkylNR $_{3COR4}$, C_{1-4} alkylNR $_{5CONR3R4}$, C_{1-4} alkylNR $_{3SO_2R4}$;

R_3, R_4 are each independently H, C_{1-4} alkyl, C_{1-4} alkylOH, C_{1-4} alkylNR $_{19R20}$, C_{1-4} alkyl cycloalkyl, C_{1-4} cyclohetalkyl, aryl, C_{1-4} alkylaryl, hetaryl, C_{1-4} alkylhetaryl, or may be joined to form an optionally substituted 3-8 membered (saturated or unsaturated) ring optionally containing an atom selected from O, S, NR $_6$;

59.

and R5 is selected from H, C₁₋₄ alkyl, aryl or hetaryl;

R6 is selected from H, C₁₋₄ alkyl, C₁₋₄alkylNR₁₉R₂₀, aryl, hetaryl, C₁₋₄ alkyl aryl, C₁₋₄ alkyl hetaryl;

R₁₉, R₂₀ are each independently selected from H, C₁₋₄alkyl;

R₁ is H, C₁₋₄ alkyl, C₁₋₆ cycloalkyl, or may form a 5-8 membered ring onto the ortho position of ring A;

Q is a bond, CH₂, C₁₋₄ alkyl;

A is aryl, hetaryl optionally substituted with 0-3 substituents independently chosen from halogen, C₁₋₄ alkyl, CF₃, OCF₃, CN, NR₈R₉, aryl, hetaryl, C₁₋₄aryl, C₁₋₄hetaryl, C₁₋₄alkylNR₈R₉, OC₁₋₄alkylNR₈R₉, nitro, NR₁₀C₁₋₄NR₈R₉, NR₈COR₉, NR₁₀CONR₈R₉, NR₈SO₂R₉, CONR₈R₉, CO₂R₈;

R₈ and R₉ are each independently H, C₁₋₄ alkyl, aryl or together form an optionally substituted 4-8 membered ring which may contain a heteroatom selected from O, S, NR₁₁;

R₁₀ is selected from H, C₁₋₄ alkyl;

R₁₁ is selected from H, C₁₋₄ alkyl;

W is selected from H, C₁₋₄alkyl, C₂₋₆alkenyl or may form a 5-8 membered ring onto the ortho position of ring A; where C₁₋₄alkyl or C₂₋₆alkenyl may be optionally substituted with C₁₋₄alkyl, OH, OC₁₋₄alkyl, NR₁₂R₁₃;

R₁₂, and R₁₃ are each independently H, C₁₋₄alkyl, or may be joined to form an optionally substituted 3-8 membered ring optionally containing an atom selected from O, S, NR₁₄;

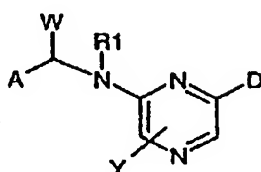
R₁₄ is selected from H, C₁₋₄ alkyl;

Y is 0-2 substituents selected from H, C₁₋₄ alkyl, NR₁₅R₁₆;

R₁₅ and R₁₆ are independently selected from H, C₁₋₄alkyl.

60.

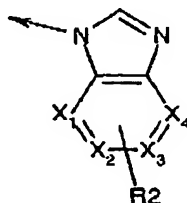
2. A compound according to formula (I) of claim 1, wherein the compound is selected from compounds of the general formula (II):



II

or pharmaceutically acceptable prodrugs, salts, hydrates, solvates, crystal forms or diastereomers thereof, wherein:

D is a heterocyclic ring selected from:



where X₁, X₂, X₃, X₄ are optionally substituted carbon, or one of X₁, X₂, X₃, X₄ is N and the rest optionally substituted carbon;

R₂ is 0-3 substituents independently chosen from H, halogen, C₁₋₄ alkyl, CF₃, OCF₃, OCHF₂, CN, aryl, hetaryl, C₁₋₄ alkylOH, C₁₋₄ alkylNR₃R₄, C₁₋₄ alkylhetaryl, OC₁₋₄ alkyl, OC₁₋₄ alkylNR₃R₄, OC₁₋₄ alkylhetaryl, OC₁₋₄ alkylOH, CO₂R₃, CONR₃R₄, NR₃R₄, nitro, NR₃COR₄, NR₅CONR₃R₄, NR₃SO₂R₄, C₁₋₄ alkylNR₃COR₄, C₁₋₄ alkylNR₅CONR₃R₄, C₁₋₄ alkylNR₃SO₂R₄;

R₃, R₄ are each independently H, C₁₋₄ alkyl, C₁₋₄ alkylOH, C₁₋₄ alkylNR₁₉R₂₀, C₁₋₄ alkyl cycloalkyl, C₁₋₄ cyclohetalkyl, aryl, C₁₋₄ alkylaryl, hetaryl, C₁₋₄ alkylhetaryl, or may be joined to form an optionally substituted 3-8 membered (saturated or unsaturated) ring optionally containing an atom selected from O, S, NR₆;

and R₅ is selected from H, C₁₋₄ alkyl, aryl or hetaryl;

61.

R6 is selected from H, C₁₋₄ alkyl, C₁₋₄alkylNR₁₉R₂₀, aryl, hetaryl, C₁₋₄ alkyl aryl, C₁₋₄ alkyl hetaryl;

R₁₉, R₂₀ are each independently selected from H, C₁₋₄alkyl;

R₁ is H, C₁₋₄ alkyl, C₁₋₆ cycloalkyl, or may form a 5-8 membered ring onto the ortho position of ring A;

A is aryl, hetaryl optionally substituted with 0-3 substituents independently chosen from halogen, C₁₋₄ alkyl, CF₃, OCF₃, CN, NR₈R₉, aryl, hetaryl, C₁₋₄aryl, C₁₋₄hetaryl, C₁₋₄alkylNR₈R₉, OC₁₋₄alkylNR₈R₉, nitro, NR₁₀C₁₋₄NR₈R₉, NR₈COR₉, NR₁₀CONR₈R₉, NR₈SO₂R₉, CONR₈R₉, CO₂R₈;

R₈ and R₉ are each independently H, C₁₋₄ alkyl, aryl or together form an optionally substituted 4-8 membered ring which may contain a heteroatom selected from O, S, NR₁₁;

R₁₀ is selected from H, C₁₋₄ alkyl;

R₁₁ is selected from H, C₁₋₄ alkyl;

W is selected from H, C₁₋₄alkyl, C₂₋₆alkenyl or may form a 5-8 membered ring onto the ortho position of ring A; where C₁₋₄alkyl or C₂₋₆alkenyl may be optionally substituted with C₁₋₄alkyl, OH, OC₁₋₄alkyl, NR₁₂R₁₃;

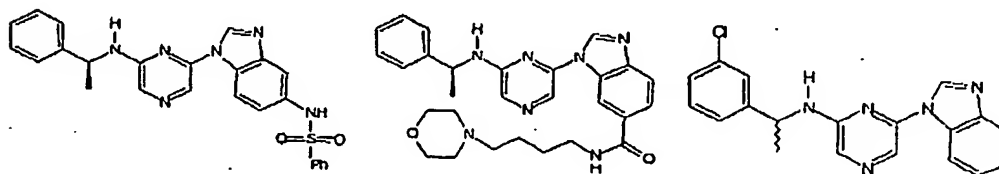
R₁₂, and R₁₃ are each independently H, C₁₋₄alkyl, or may be joined to form an optionally substituted 3-8 membered ring optionally containing an atom selected from O, S, NR₁₄;

R₁₄ is selected from H, C₁₋₄ alkyl;

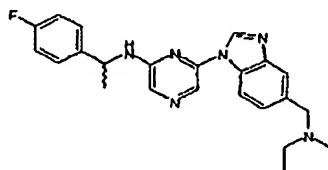
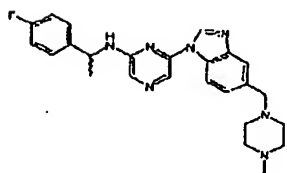
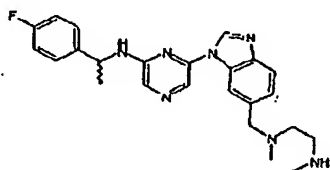
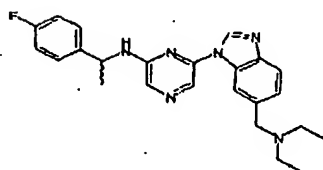
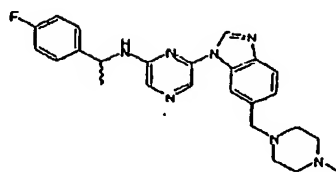
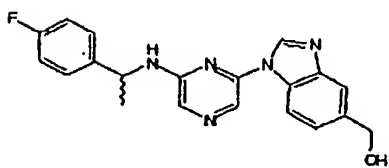
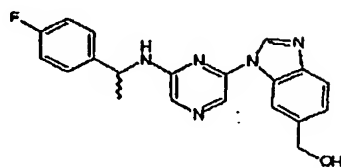
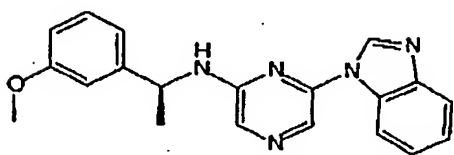
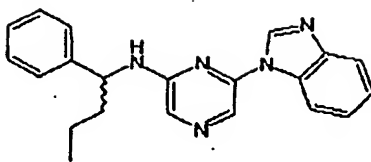
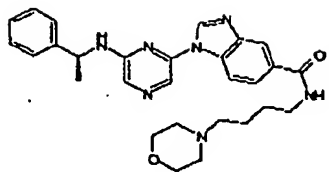
Y is 0-2 substituents selected from H, C₁₋₄ alkyl, NR₁₅R₁₆;

R₁₅ and R₁₆ are independently selected from H, C₁₋₄alkyl.

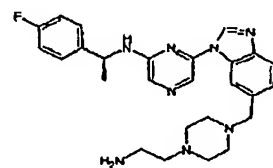
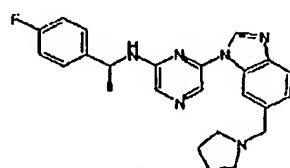
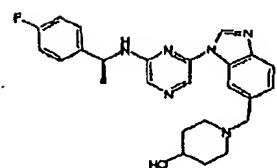
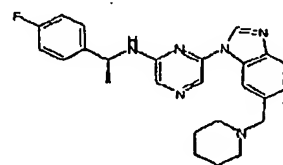
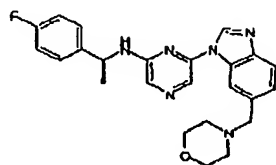
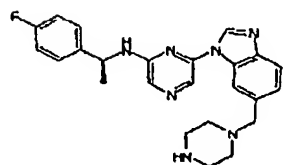
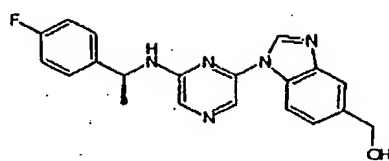
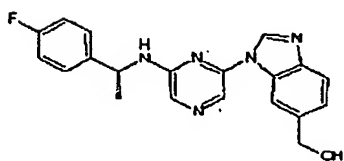
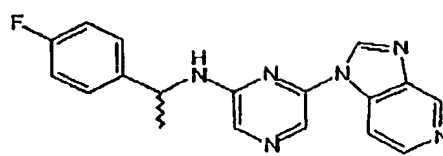
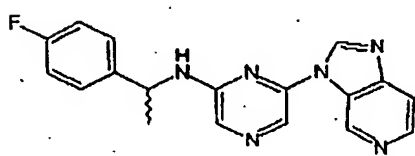
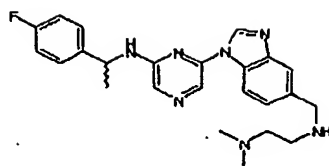
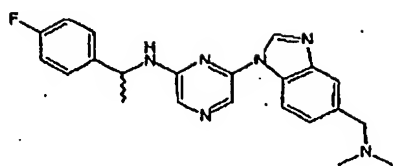
3. A compound according to formula (I) of claim 1 selected from the group consisting of:



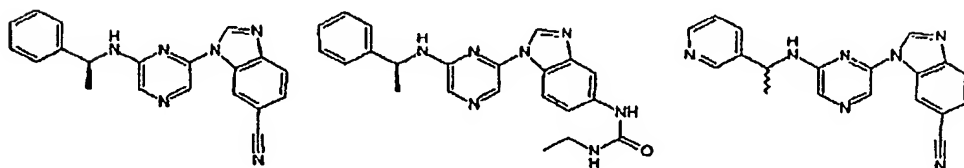
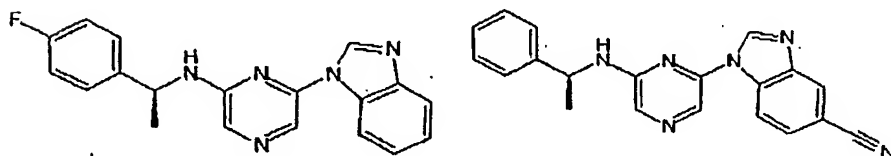
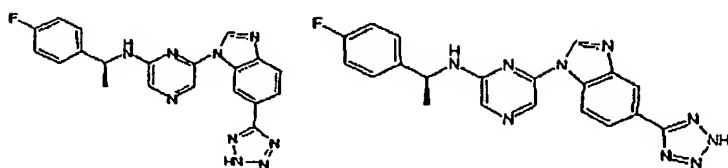
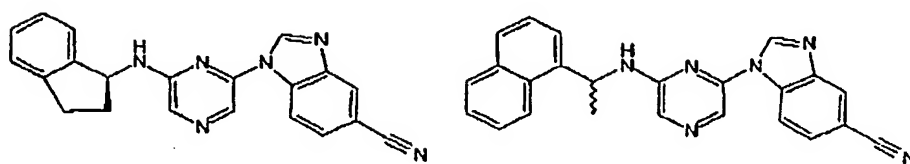
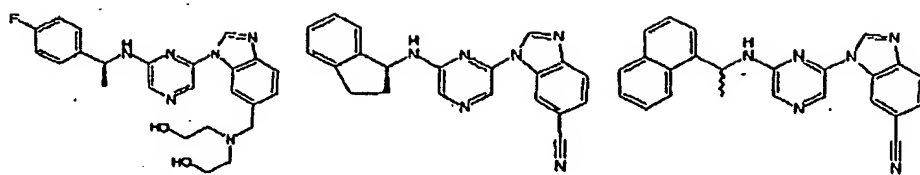
63.



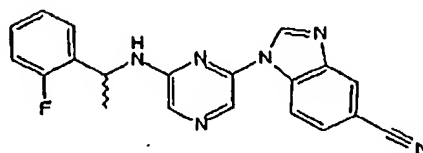
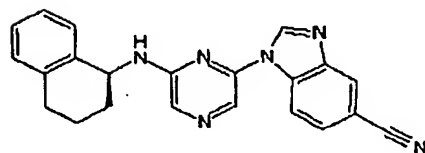
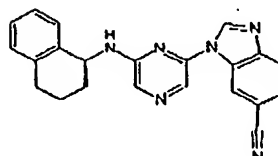
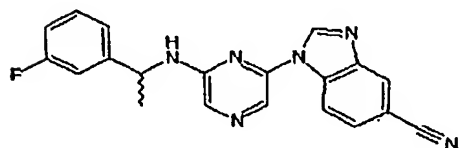
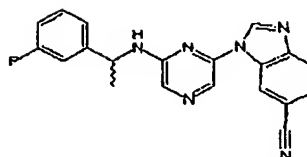
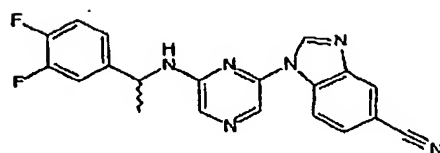
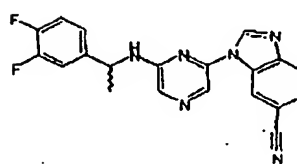
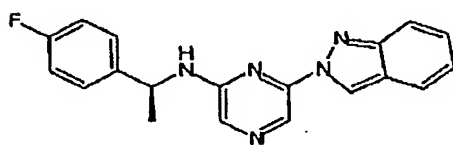
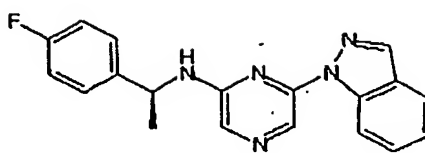
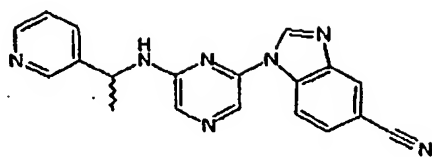
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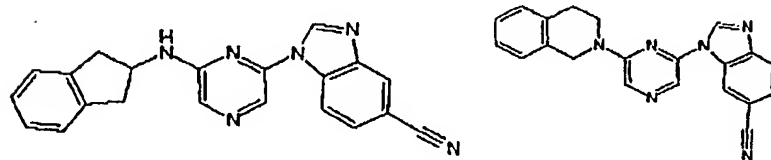
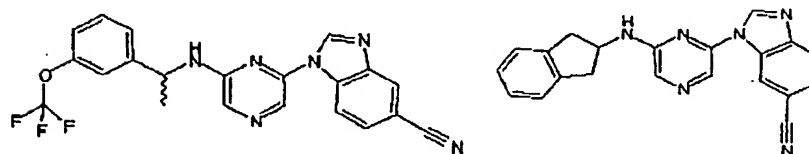
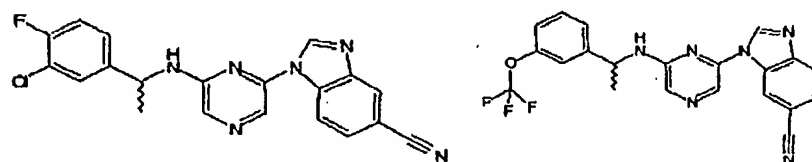
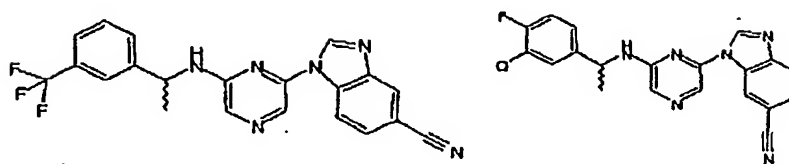
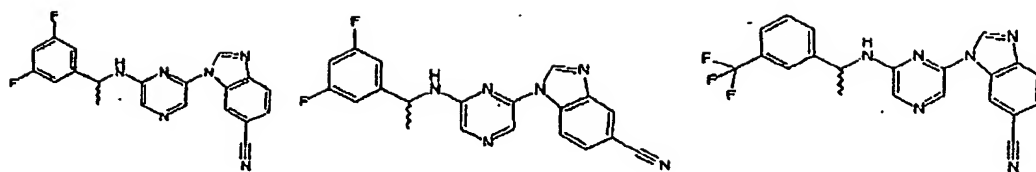
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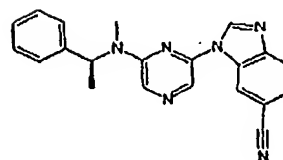
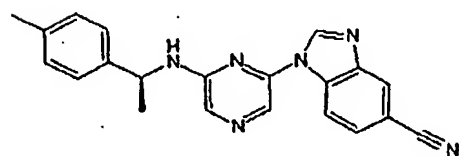
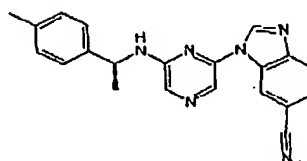
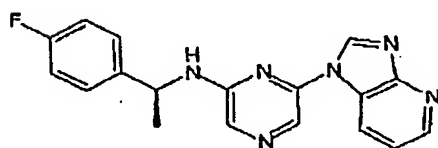
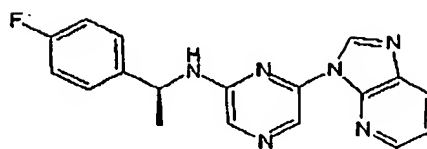
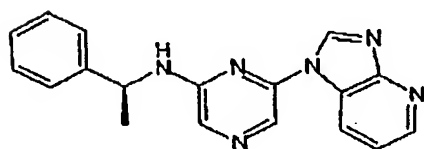
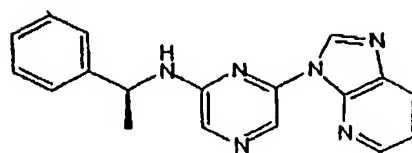
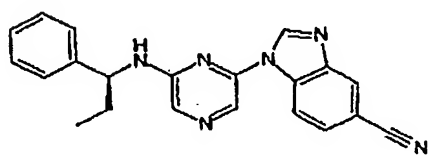
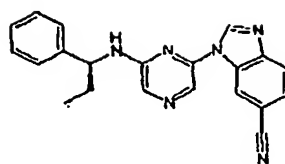
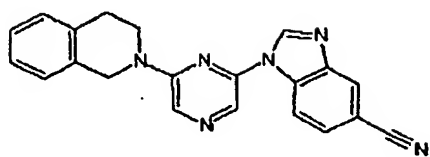
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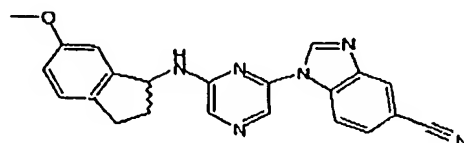
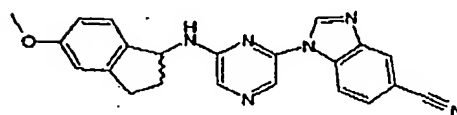
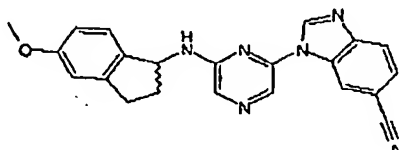
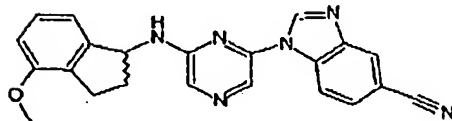
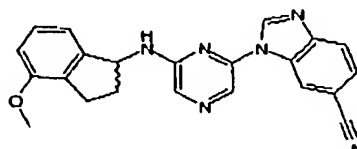
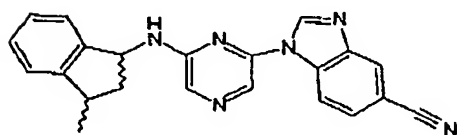
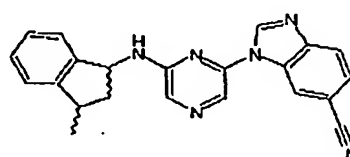
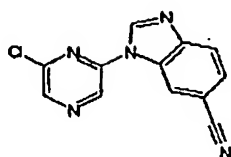
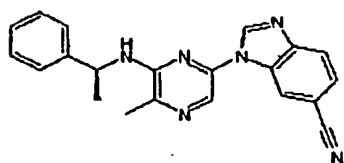
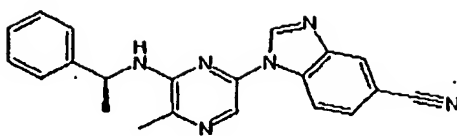
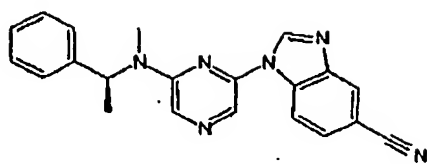
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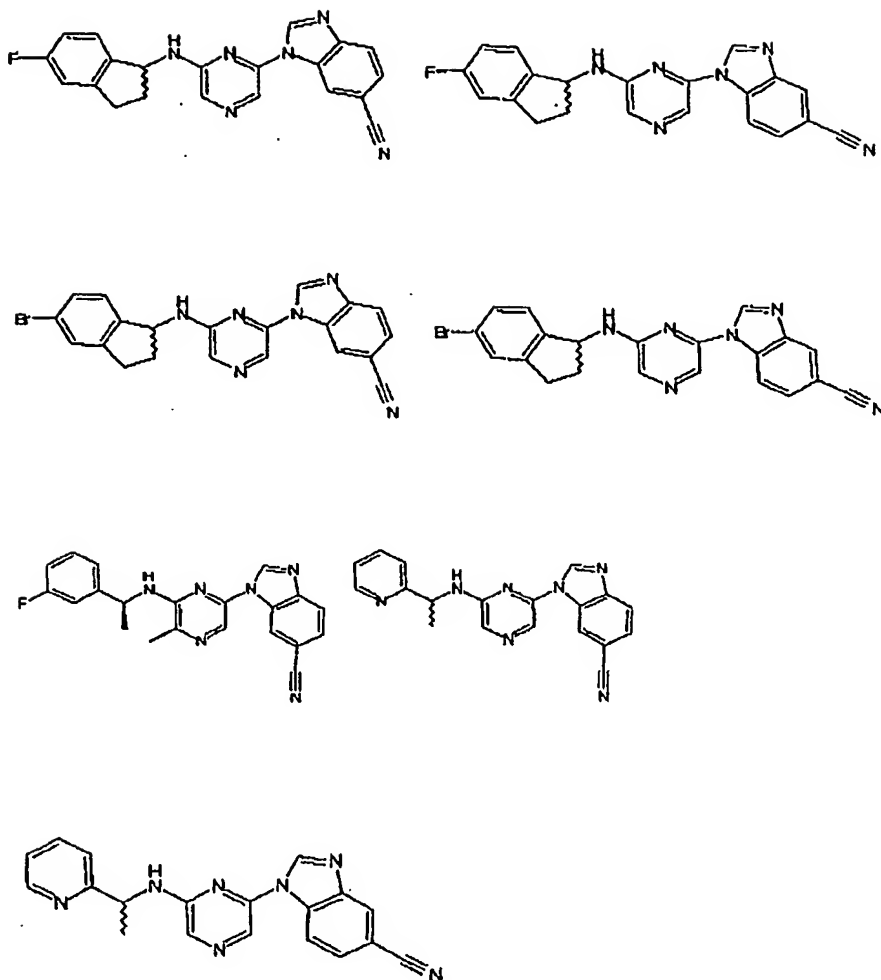
68.



69.



70.

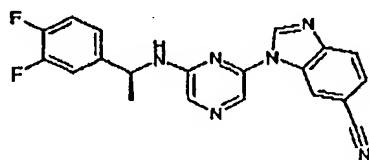


4. A compound according to formula (I) of claim 1 selected from the group consisting of
- 6-(1H-Benzimidazol-1-yl)-N-benzylpyrazin-2-amine,
 - 6-(1H-Benzimidazol-1-yl)-N-[(1R)-1-phenylethyl]pyrazin-2-amine,
 - 6-(1H-Benzimidazol-1-yl)-N-[(1S)-1-phenylethyl]pyrazin-2-amine, 1-(6-[[1-(3-Fluorophenyl)ethyl]amino]pyrazin-2-yl)-1H-benzimidazole-5-carboxamide, 1-(6-[[1-(3-Fluorophenyl)ethyl]amino]pyrazin-2-yl)-1H-benzimidazole-6-carboxamide, 1-(6-[[1-(3-Fluorophenyl)ethyl]amino]pyrazin-2-yl)-1H-benzimidazole-6-carbonitrile, 1-[6-(3,4-Dihydroisoquinolin-2(1H)-yl)pyrazin-2-yl]-1H-benzimidazole-5-carbonitrile, 1-[6-(3,4-

71.

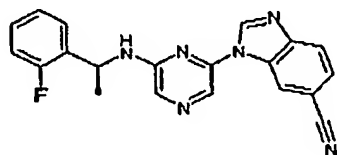
Dihydroisoquinolin-2(1H)-yl}pyrazin-2-yl}-1H-benzimidazole-6-carbonitrile, 1-{6-[(1S)-1,2,3,4-Tetrahydronaphthalen-1-ylamino]pyrazin-2-yl}-1H-benzimidazole-5-carbonitrile, 1-{6-[(1S)-1,2,3,4-Tetrahydronaphthalen-1-ylamino]pyrazin-2-yl}-1H-benzimidazole-6-carbonitrile, 1-{6-[(1S)-1-Phenylethyl]amino}pyrazin-2-yl}-1H-benzimidazol-5-amine, 1-{6-[(1S)-1-Phenylethyl]amino}pyrazin-2-yl}-1H-benzimidazol-6-amine, N-[1-(6-[(1S)-1-Phenylethyl]amino)pyrazin-2-yl]-1H-benzimidazol-6-yl]-2,2-dimethylpropanamide, N-[1-(6-[(1S)-1-Phenylethyl]amino)pyrazin-2-yl]-1H-benzimidazol-5-yl]acetamide, N-[1-(6-[(1S)-1-Phenylethyl]amino)pyrazin-2-yl]-1H-benzimidazol-5-yl]methanesulfonamide, 2-(S- α -Methylbenzylamino)-6-(5-(N-methylpiperazin-4-yl-methyl)-benzimidazo-1-yl)-pyrazine, [1-(6-[(1-(4-Fluorophenyl)ethyl]amino)pyrazin-2-yl)-1H-benzimidazol-5-yl]methanol, [1-(6-[(1-(4-Fluorophenyl)ethyl]amino)pyrazin-2-yl)-1H-benzimidazol-6-yl]methanol and N-[1-(4-Fluorophenyl)ethyl]-6-{6-[(4-methylpiperazin-1-yl)methyl]-1H-benzimidazol-1-yl}pyrazin-2-amine.

5. The compound:



or a pharmaceutically acceptable prodrug, salt, hydrate, solvate, crystal form or diastereomer thereof.

6. The compound:



or a pharmaceutically acceptable prodrug, salt, hydrate, solvate, crystal form or diastereomer thereof.

7. A composition comprising a carrier and at least one compound according to any one of claims 1 to 6.

72.

8. A method of treating a tyrosine kinase-associated disease state in a subject, the method comprising administering a therapeutically effective amount of a compound according to any one of claims 1 to 6 or a composition according to claim 7.
9. A method of treating a kinase-associated disease state according to claim 8, wherein the disease state involves JAK1, JAK2, JAK3 or TYK2.
10. A method according to claim 8 or 9 wherein the disease state is selected from the group consisting of Atopy, Cell Mediated Hypersensitivity, Rheumatic Diseases, Other autoimmune diseases, Viral Diseases, Cancer, Neurodegenerative Diseases, and Cardiovascular Diseases.
11. Use of a compound according to any one of claims 1 to 6 or a composition according to claim 7 for use in the preparation of medicaments for the treatment of JAK-associated disease states.
12. A method of treating diseases and conditions associated with inflammation and infection in a subject, the method comprising administering a therapeutically effective amount of at least one compound according to any one of claims 1 to 6 or a composition according to claim 7.

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